# The Connection

A WELL DRILLING INDUSTRY NEWSLETTER

MISSOURI
DEPARTMENT OF NATURAL RESOURCES

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## CARBON FIBER DRILL PIPE PERFORMS FLAWLESSLY IN FIRST FIELD TEST

Fossil Energy Techline reported on the first field test of a new type of drill pipe. The Energy Department's National Energy Technology Laboratory announced the successful first field test on January 9, 2003. The DOE reported that the drill pipe, made from carbon fiber resins by Advanced Composite Products and Technology, Inc., (ACPT) of Huntington Beach, California, was tested in a "short radius" horizontal drilling field test in Tulsa County, Oklahoma. The company that conducted the test, Grand Resources, Inc., of Tulsa, is using the pipe in a second well and has plans for using it in as many as 14 additional wells.

The new drill pipe is the latest product of the Energy Department's oil and gas research program, and it could be a major boon to energy producers in the United States. Much of the "easy-to-produce" oil in the nation has been produced already, and many U.S. companies are looking for a lower cost method to recover oil and gas that may have been bypassed when fields were first opened. The carbon fiber drill pipe allows a company to re-enter an older, vertical well and drill horizontal offshoots into oil/gas bearing formations that were previously deemed uneconomical. A horizontal well could penetrate several hundred (or even several thousand) feet of rock unit, which would allow substantially more drainage of gas/oil than in a traditional vertical well. In the past, the short-radius reentry well where the drill pipe arcs in a 20 to 80 foot radius would create stress and fatigue damage which decreases the drill pipe's life and reliability. While more expensive than a traditional steel pipe, the carbon fiber drill pipe can remain bent for extended periods of time without suffering fatigue damage. Fewer pipe failures occur, less pipe is needed because of the shortened radius, and the drill pipe can be reused in multiple wells. Also, a major advantage is that carbon fiber-epoxy resin drill pipe is likely to weigh less than half the weight of steel drill pipe. It is also ideal for embedding an electrical wire inside the resin to provide a high-speed data link for transmitting electronic information to and from the drill bit. As more and more research is done toward directional "smart drilling systems", composite drill pipe could become a major component in that research.

In the Oklahoma test, Grand Resources re-entered an existing vertical well that had stopped producing in 1923. Just below a depth of 1200 feet, the well driller started a new borehole using a 2.5 inch (outside diameter) composite drill pipe that curved in a 70-foot radius until it became horizontal. The well was then drilled an additional 1000 feet. The horizontal well struck an oil-bearing zone, and is expected to produce 30 to 50 barrels of oil per day for well into the future.

The research and development of composite drill pipe is being funded through a 3.6 million dollar contract from the Energy Department's office of Fossil Energy. ACPT is providing nearly 800,000 dollars in cost-sharing money and more than 600,000 dollars in equipment.

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## WELL INSTALLATION BOARD MEETING

The next scheduled meeting of the Well Installation Board will be May 19, 2003 and the Phelps County Courthouse in Rolla Missouri. Open session will begin at 10:00 A.M.

The August meeting is tentatively set for August 22, 2003 at the Phelps County Courthouse in Rolla Missouri. Open session will begin at 10:00 a.m.

## EASY LOCATING TOOL

Those who have accessed the Internet know that it can be a very useful tool. Web sites exist that specialize in map access for topographic map users. Whether for professional or personal use, these sites can be easily accessed and are user friendly. One example is *topozone.com.*

Some sites possess a search mechanism where the topographic map name and respective state can be entered to bring up the map. The map can then be observed at different scales to find the location of an object, such as a newly drilled well. A locator tool exists within most of these sites. For example: If a person knows where an object or point (such as a well) exists on a topographical quadrangle map, the

*continued next page...*

***Easy Locating Tool** continued...*

projected location coordinates can be easily obtained. By setting the locator tool to read latitude/longitude, the mouse acts as a pointer that can be placed on an object or point to reveal the projected location. This is a very handy tool that can be used by anyone in the well drilling industry for quick, easy, and accurate location of a new or abandoned well.

For those who require a paper copy to aid in locating objects, the state topographic map location guide can be obtained free of charge. Also, topographic maps for the state of Missouri, at different scales, are available for $6 to $7. These items may be obtained at the following:

Department of Natural Resources
Geological Survey and Resource Assessment Division
Maps and Publications
P.O. Box 250
Rolla, MO 65402
(573) 368-2125
www.dnr.mo.gov/geology/adm/publications/index.html (A link to order information exists on this site.)

## HOW MUCH DRINKING WATER DO WE USE

On average, each individual in the United States in some way uses approximately 100 gallons of water per day. Only a small portion is actually used for drinking. As residential water consumers, we use most of the water for other purposes such as toilet flushing, bathing, cooking, cleaning and lawn watering.

The amount of water we use varies during the day:

The lowest rate of use is between 11:30p.m. to 5:00a.m.

The highest rate is between 5:00a.m. to noon with a peak of use from 7:00 to 8:00a.m.

There is a moderate use from noon to 5:00p.m. with a lull around 3:00p.m.

Use increases in the evening from 5:00p.m. to 11:00p.m. with a second minor peak, 6:00 to 8:00p.m.

Per person water usage for simple purposes:

Laundry: 8.5 gallons per person
Bathing: 20 gallons per person
Toilet flushing: 24 gallons per person
Drinking and Cooking: 2 gallons per person
Garbage Disposal: 1 gallon per person
Dishwashing: 4 gallons per person
Car Washing: 2.5 gallons per person
Lawn Watering and Pools: 25 gallons per person.

A typical family of four on a public water supply uses about 350 gallons per day at home. In contrast, a typical household that gets its water from a private well uses about 200 gallons for a family of four. In our communities an additional 35 gallons of water per person are used for public activities such as fire fighting, street washing, and park maintenance.

The United States uses more water than other countries, even those that are equally well developed.

One-hundred gallons of water per day may not seem like a lot of water per individual, but it all adds up.
Source: Todd *The Water Encyclopedia*.

## AREA 5 DRILLERS

Drillers in Area 5, the Bootheel region and all major stream alluvial areas, should be aware that the use of 3-inch casing in water wells is not allowed by regulation, even in jetted wells. In unconsolidated materials such as sand and gravel, the minimum size casing allowed by regulation is 4 inches (nominal). Wells are exempt from regulation only if **all** of the following conditions are met:

1. Wells are jetted, drilled, driven, washed, or constructed in other ways.

2. Wells are constructed in unconsolidated materials.

3. Well casing diameters are no larger than 2 inches.

## NEW PAGER NUMBER

If you've tried to page the section staff and just couldn't get through, you are not alone. The Section recently changed pager services. The new number is 888-212-9038. Pager service can be utilized Monday through Friday, 5pm-10pm, and weekends 8am – 10pm.

Pager service was implemented to better serve the drilling community after normal business hours. We would appreciate it if correspondence relating to issues of a general nature, or issues that require researching files for information be made during normal business hours.

## WE'VE GONE PLASTIC

The Wellhead Protection Section has recently made the decision to go plastic!! The section will begin taking credit cards on May 1, 2003 in order to accommodate the public more easily. The types of credit cards taken at this time are MasterCard and Visa.

Please feel free to use a credit card to pay your permitting and testing fees or order publications. We will only be accepting payment by credit card for certification fees if the certification form was previously submitted. When calling in please have your credit card number and expiration date available, as this information is required to process your request.

## EDITOR'S NOTE

*If you have any suggestions, ideas, or comments concerning this newsletter, please let us know.*

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## OUR WATERY EARTH

The United States enjoys one of the best supplies of drinking water in the world. Nevertheless, many of us who once gave little or no thought to the water that comes from our taps are increasingly asking the question: "How much water is there?"

The Earth is a watery place. About 70 percent of the Earth's surface is covered by water. Water also exists in the air as water vapor, in the ground as soil moisture and in aquifers. Thanks to the water cycle our planet's water supply is constantly moving from one place to another and from one form to another. Things would get pretty stale without the water cycle!

When you take a look at the water around you, you see water in streams, rivers, and lakes. You see water sitting on the surface of the earth. This water is known as "surface water." Your view of the water cycle might be that when rain falls it fills up the rivers and lakes. But, how would you account for the flow in rivers after weeks without rain? Why do most springs in the Ozarks continue to flow even in the worst drought? The answer is, there is more to our water supply than just surface water. There is also plenty of water beneath our feet.

Even though you may only notice water on the Earth's surface, there is much more water stored in the ground than there is on the surface. In fact, some of the water you see flowing in rivers comes from seepage of groundwater into riverbeds. Water from precipitation continually seeps into the ground to recharge the aquifers, while at the same time water from underground aquifers continually recharges rivers through seepage.

Humans are happy when this happens because people make use of both kinds of water. In the United States in 1995, we used about 321 billion gallons per day of surface water and about 77 billion gallons per day of groundwater. In a way, that underestimates the importance of groundwater, since not only does groundwater help keep our rivers and lakes full, it also provides water for people in places where visible water is scarce, such as in the desert towns of the Western United States. Without groundwater, people would be sand surfing in Palm Springs, Ca. instead of playing golf!

***Just how much water is there on (and in) the Earth?***

Here are some numbers you can think about:

The total water supply of the world is 326 million cubic miles (a cubic mile is an imaginary cube measuring one mile on each side). A cubic mile of water equals more than one trillion gallons.

About 3,100 cubic miles of water, mostly in the form of water vapor, is in the atmosphere at any one time.

If it all fell as precipitation at once, the Earth would be covered with only about 1 inch of water.

The 48 contiguous United States receives a total volume of about 4 cubic miles of precipitation each day.

Each day, 280 cubic miles of water evaporate or transpire into the atmosphere.

If all of the world's water was poured on the United States, it would cover the land to a depth of 90 miles.

Of the freshwater on Earth, much more is stored in the ground than is available in lakes and rivers. More than 2,000,000 cubic miles of fresh water is stored in the Earth, most within one-half mile of the surface. Contrast that with the 60,000 cubic miles of water stored as fresh water in lakes, inland seas, and rivers. Most of the world's fresh water is stored in the 7,000,000 cubic miles of water found in glaciers and the polar icecaps.

Statistics provided by USGS

## NEWTON/JASPER COUNTY WELL CONSTRUCTION DATA, 2002

The following statistical data have been compiled from well records received in 2002.

Total 2002 wells in Special Area 2 (Newton and Jasper counties ..... 263
- Newton County wells ..... 165
- Jasper County wells ..... 98

Wells certified ..... 129

Wells without pump records and without chemical data . 66

Wells in need of chemical data for completion of certification .. 65

Outstanding NOVs for chemical data ..... 24

Clean wells missing records ( pump records, well records, or both) ..... 15

Wells cased into 2nd aquifer (1 well was a public well) ..... 14

Wells with initial lead exceedence ..... 10

Wells with initial cadmium exceedence ..... 1

Based on the numbers presented, the major setback to well certification is submittal of well records without pump records and vice versa. Timely collection of water samples and submittal of analytical data is a close second. Many of the problems with chemical data reports have been from analyses conducted with detection limits above regulatory levels; this type of data is worthless.

So far, wells that have been found to be in exceedance of regulatory levels have been resampled and analyzed to find chemical concentrations below regulatory levels. Quality control sampling conducted independently by the Wellhead Protection Section staff seems to concur with this trend. Analytical data from our resampling efforts has confirmed concentrations below regulatory levels.

## FARE-THEE-WELL

Neomia Robinson, Unit Chief of the Administrative Unit, Wellhead Protection Section is leaving the Geological Survey and Resource Assessment Division as of March 3, 2003.

Neomia began working for the Division in the Wellhead Protection Section on March 12, 1990. During her time with the Division, she has made many friends within the Wellhead Protection section and throughout the drilling industry.

Neomia is leaving to operate her own business in the Phelps county area. We are all happy for her and wish her all the best in what we know will be a bright new future.

## WELCOME

Beanland & Sons Well Drilling\ Matthew Beanland
Bedford Building Supply\Mark Weese
Bill Wineland Drilling\Jamie Wineland
Bud Emily Drilling\Bud Emily
Childers & Son Well Drilling\Ricky Childers
Conestoga-Rovers\GeorgeCole IV
Daniels Pump & Plumbing\Kyle Smading
Geoconsultants\James Calhoun
Geomaster-Midwest Geothermal\ Aaron Stevens, Michael Stevens
Goggins Drilling\Terry Gibson
Grace\Steven Michael Grace
Hewitt Well Drilling \ Don Rosebrough, Zack Jones
Holcomb Pump Service\Zachary Holcomb
Innovative Technical Solutions\ Shau-Luen Barker
International Environmental Associates\ William Foss
Irrigation Central\John Byrd, Chad Engram
Kingston Environmental\Gary Murphy
L & J Pump\Gary O'Day
McKinzie Construction\Wood Ramsey
Mid-Way Pump\Robert Moad Jr.
Midwest Geothermal\Brian Otto
Quality Testing & Engineering\ Jack Mutchler
Ratterree & Barnes Pump Service\ Jason Payne
Saberprobe LLC\Thomas Payton
Schroeder Rotary Drilling\Thomas Schroeder, Anthony Smasal, Jiniwin Schroeder, Tommy Remington
Wil-Co Drilling\Nathan Wilson

## FAREWELL

ATC Associates\Todd Tisch
B E & K/Terrranext\Leah Ellis
Belcher Well Drilling\Darren Belcher
Burns & McDonnell\Timothy Stecher
C & B Drilling\Kenneth Burdett
Clayton Environmental\Michelle Wagner
Ensr International\Michael Kirby
Environmental Engineering\Scott Schrimpf
Flynn Drilling\Charles Stockwell
HDR Engineering\E Kohman
Hewitt Well Drilling\Chase Belew
Gotto Environmental\Daniel Gotto
Grove Drilling\Dale Lett
L & J Pump & Drilling\Loyola Sommer
Layne Christensen\Phillip Harris
Marshall Eye Jr. Drilling\William Gibson
McKinzie Construction\Russell Sybert
MO Dept of Natural Resources\ James Harris
Rogers Comfort Systems\David Mackey
Sunbelt Environmental\Becki Michel
Strader Drilling\Ronald Strader
Ted Huston\Ted Huston
Transystems Corp\Gregory Teller
Wellington Environmental\ Heather Stork

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